COMMUNICATIONS EQUIPMENT MODIFICATION NOTE 57, REVISION A, ERRATA 2
(for Electronics Technicians)
Maintenance, Logistics, and Acquisition Division
W/OPS12: GSS

SUBJECT:	Console Replacement System (CRS) Output Channel Expansion
PURPOSE:	To expand the capabilities of the CRS system from a Large 6-channel to a Large 7-channel configuration.
SITES AFFECTED:	Site Name: Raleigh, NC; SID: RAH; Org. Code: WN9306
EQUIPMENT AFFECTED:	CRS (B440)
PARTS REQUIRED:	The parts required are issued to each site by W/OPS12 from the National Logistics Support Center under the applicable approved site-specific Request for Change. 2 - DECtalk card (ASN: B440-2A2A11) 1 - Audio switch module (ASM) card (ASN: B440-2A6A3) 2 - DECtalk-ASM audio cable (ASN: B440-4W12) 1 - NOAA Weather Radio Specific Area Message Encoder (NWRSAME)-audio control panel (ACP) interface cables (ASN: B440-1A5W4) 1 - DOS formatted diskette with CRS test database ASCII files (provided by W/OPS12)
PARTS SUPPLIED BY THE SITE:	1 - Transmitter audio output cable 1- NWRSAME Cable marking tags and tie-wraps, as needed Compact disk (CD) containing current CRS application software version (used in section 3.3)
TOOLS AND TEST EQUIPMENT REQUIRED:	#1 and #2 Phillips screwdrivers CRS test database ASCII files diskette provided by W/OPS12 (see Parts Required) Small flat-blade jeweler's screwdriver Root-mean-square (RMS) voltmeter/dB meter 600-ohm dummy load with attached RJ-11 plug Antistatic workstation kit AM-48 Test Set
TIME REQUIRED:	2 Hours
EFFECT ON OTHER INSTRUCTIONS:	CRS Modification Note 57, Revision A, Errata 2 adds WFO RAH to the list of sites affected.
SPECIAL REQUIREMENTS:	Two people are required for Part 7.

AUTHORIZATION:	The authority for his modification is Request for Change AB534.
VERIFICATION STATEMENT:	This procedure was tested and verified at National Weather Service Headquarters, Silver Spring, MD (SLVM2).
GENERAL:	The attachments to this procedure provide the instructions to perform this modification.
PROCEDURE:	Attachment **A** provides modification implemention procedures. Attachment **B** (CRS Hardware Drawings) provides reference information. Attachment **C** provides verification of the new physical configuration (used before applying power). Attachment **D** provides a completed Engineering Management Reporting System (EMRS) report sample.
REPORTING INSTRUCTIONS:	Report the completed modification using EMRS following the instructions in the NWS Instruction 30-2104, Maintenance Documentation, Part 4 and Appendix G. Include the following information in the report. a. Block 7**: CRSSA** b. Block 8**: 001** c. Block 17a**: 57A** A sample EMRS report is provided as attachment **D**.

Signature Not Verified

Mark S. Paese

Digitally signed by Mark S. Paese
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Attachment **A** - Modification Procedure
Attachment **B** - CRS Hardware Drawings
Attachment **C** - New Configuration Physical Verification
Attachment **D** - Sample EMRS Report

ATTACHMENT A
Modification Procedure

OVERVIEW

This modification note provides instructions for expanding a Console Replacement System (CRS) from a Large 6-channel configuration to a Large 7-channel configuration. The modification procedure contains seven parts:

1. CRS Power-Down Procedures

2. Equipment Upgrade Procedures

3. CRS Power-Up Procedures

4. CRS Login, Application Software Error Verification, and Test Database ASCII File Loading Procedures

5. Post Hardware Expansion Channel Operability Verification Procedures

6. Adding New Transmitter Channels and Editing Site Database ASCII File Procedures

7. CRS Alignment Procedures

NOTE: 1. Read the entire procedure, and verify receipt of all required parts before proceeding with the actual modification.

2. Coordinate with the operations staff before performing this procedure.

CAUTION

CRS must be down to perform the expansion modification. This modification contains test messages that must not be broadcast on any transmitter.

In addition, the site database ASCII file will be recompiled and all dictionary files will be lost! Switch to the backup NWR system, and ensure the dictionary files are backed up (see the *CRS System Administration Manual*) before performing this modification.

PART 1 - CRS POWER-DOWN PROCEDURES

1.1 CRS Application Shutdown

1. Click the *System* menu and click **Stop System**.
2. Wait until all icons on the *CRS System Status* menu turn **red**.

1.2 UNIX Shutdown

NOTE: 1. The shutdown of the CRS application is just one task before the graceful power-down. After stopping the CRS application software, implement a "controlled/orderly UNIX shutdown with NO automatic reboot" on the main processor (MP), and implement a "controlled/orderly UNIX shutdown" on all FEPs. Upon completion of the controlled/orderly UNIX shutdown, power-down the processors in the following order: MPs first followed by the FEPs.

1. Click the **Maintenance** menu in the main CRS menu to access the *Maintenance* pull-down menu.
2. Click **UNIX Shell** in the *Maintenance* pull-down menu. A *UNIX xterm* window opens for the entry of UNIX commands.
3. Type the following UNIX command in the *xterm* window:

   su root

4. Press **<Enter>**. The shell responds with a prompt to enter root passwords.
5. Type the password for the root.
6. Press **<Enter>**. The shell prompt changes to a pound sign indicating that all subsequent UNIX command entries have root authority.
7. Type the following UNIX command in the *xterm* window:

   rsh 5MP /sbin/shutdown -i0 -g0 -y

8. Press **<Enter>**. The shell command prompt returns after displaying a confirmation of shutdown initiation on 5MP. UNIX on processor 5MP shuts down.
9. Type the following UNIX command in the *xterm* window:

   rsh 1FEP /sbin/shutdown -i0 -g0 -y

10. Press **<Enter>**. The shell command prompt returns after displaying a confirmation of shutdown initiation on 1FEP. UNIX on processor 1FEP shuts down.
11. Type the following UNIX command in the *xterm* window:

    rsh 2FEP /sbin/shutdown -i0 -g0 -y

12. Press **<Enter>**. The shell command prompt returns after displaying a confirmation of shutdown initiation on 2FEP. UNIX on processor 2FEP shuts down.
13. Type the following UNIX command in the *xterm* window:

    rsh 4BKUP /sbin/shutdown -i0 -g0 -y
14. Press **<Enter>**. The shell command prompt returns after displaying a confirmation of shutdown initiation on 4BKUP. The UNIX on processor 4BKUP shuts down.
15. Type the following UNIX command in the *xterm* window:

    cd /
16. Press **<Enter>**.
17. Type the following UNIX command in the *xterm* window:

    /sbin/shutdown -i0 -g0 -y
18. Press **<Enter>**. Each CRS processor for the system may be safely powered-down when UNIX indicates shutdown is complete with the message:

    Press any key to reboot…. ***Do not reboot*** any machine; go to section 1.3.

1.3 CRS Hardware Power-Down

Power-down all CRS equipment at the operator's station and in the equipment room by turning off the following:

Operator's Station	**Equipment Room**
0MP and Monitor	4BKUP
5MP and Monitor	1FEP
NWRSAME (all)	2FEP
	LAN bridge
	LAN server
	Monitor
	Printer
	Audio switching assembly (ASA) power supplies
	Modem

PART 2 - EQUIPMENT UPGRADE PROCEDURES

NOTE: The 1FEP and 4BKUP DECtalk card setup procedures in part 2, sections 2.1 and 2.2, can be performed prior to shutting down the system. This will save downtime for the current operational CRS.

2.1 1FEP and 4BKUP DECtalk Card Removal

CAUTION

Removing and replacing circuit cards must be accomplished in an antistatic work area using approved antistatic procedures. Refer to attachment C and ensure all equipment cabling is properly marked before removal.

1. Remove all cabling from 1FEP and 4BKUP and remove the FEPs from the equipment rack to the antistatic work area (see attachment **B**, figure A-5).
2. Remove the right side covers of the 1FEP and 4BKUP units using the following procedure:
   a. Remove and retain the right three screws located on the back of the system unit. These screws secure the right side access panel of the system to the chassis (see attachment **B**, figure A-1).
   b. Pull the panel backward and lift upward.
3. Remove and retain the screws holding expansion slot cover 5 on 1FEP and 4BKUP.
4. Remove the expansion slot covers.

2.2 1FEP, 2FEP and 4BKUP DECtalk Cards Input/Output (I/O) Address Configuration

NOTE: 1. Depending on the CRS site configuration, there may be as many as five DECtalk cards per FEP. In slots 2 through 6, DECtalk cards are identified as module numbers 0, 1, 2, 3, and 4.

1. Configure each new DECtalk card for the appropriate I/O address, through switch 2 (SW2), as defined in table 1 and pictured in attachment **B**, figure A-11.

Table 1. DECtalk Card Switch 2 (SW2) Settings

Module#	SW2-1	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	I/O Address	PC Slot
0	off	off	off	on	off	off	240	2
1	off	on	off	on	off	off	250	3
2	on	off	on	off	off	on	328	4
3	off	off	on	on	off	on	360	5
4	off	off	off	off	on	on	380	6

NOTE: 2. Regardless of FEP, DECtalk card configuration remains constant; meaning, modules 0, 1, 2, 3, and 4 are configured the same for each FEP.

2. Use table 1 to set up the new DECtalk cards with the I/O address: 360. Install the DECtalk cards into slot 5 of 1FEP and 4BKUP, and reinstall a retaining screw.

3. Replace the right side cover on the 1FEP and 4BKUP units using the reverse procedure in section 2.1, step 2.

4. Reinstall 1FEP and 4BKUP in the CRS main unit cabinet. Refer to attachment **C** and reinstall all cabling, with the exception of the DECtalk-to-ASM audio cables.

2.3 ASM Card Installation

1. Remove the ASA slot 7 cover by removing the two screws.

NOTE: There are five jumpers to be set on each ASM card (see table 2).

Table 2. ASM Card Jumper Settings

ASM Card	ASA Slot #	Silence Alarm Jumper JP1	ACP Channel Select Jumper JP2 & JP3	BKUP Live/ Playback Cntrl Jumper JP4	FEP Select Jumper JP5
ASM 1 (channel 1)	1	EN (Enable)	1	BUL2	1FEP
ASM 2 (channel 2)	2	EN (Enable)	2	BUL2	1FEP
ASM 3 (channel 3)	3	EN (Enable)	3	BUL2	1FEP
ASM 4 (channel 4)	4	EN (Enable)	4	BUL2	1FEP
ASM 5 (channel 5)	5	EN (Enable)	5	BUL2	2FEP

Table 2. ASM Card Jumper Settings (Continued)

ASM Card	ASA Slot #	Silence Alarm Jumper JP1	ACP Channel Select Jumper JP2 & JP3	BKUP Live/ Playback Cntrl Jumper JP4	FEP Select Jumper JP5
ASM 6 (channel 6)	6	EN (Enable)	6	BUL2	2FEP
ASM 7 (channel 7)	7	EN (Enable)	7	BUL2	2FEP
ASM PB1 (mon/playback chan 1)	PB1	DIS (Disable)	PB1	PB	1FEP
ASM PB2 (mon/playback chan 2)	PB2	DIS (Disable)	PB2	PB	2FEP

2. Take the new ASM card and set the jumpers for slot 7 of the ASA according to table 2.
3. Install the new ASM card into slot 7 of the ASA chassis and tighten the two screws.
4. Using table 2, reconfigure the existing ASM cards in slots 4, 5, and 6.

2.4 DECtalk-ASM Audio Cable Installation

1. Using write-on cable labels, mark and connect the new and existing DECtalk-ASM audio cables according to table 3.
2. Reconnect and relabel the existing DECtalk-ASM audio cables on 1FEP and 2FEP according to table 3.

Table 3. DECtalk to ASM Audio Cables

From	To	Cable Label
1FEP DECtalk 1 “J2” Port	ASM 1 “IN Port”	1-1
1FEP DECtalk 2 “J2” Port	ASM 2 “IN Port”	1-2
1FEP DECtalk 3 “J2” Port	ASM 3 “IN Port”	1-3
1FEP DECtalk 4 “J2” Port	ASM 4 “IN Port”	1-4
2FEP DECtalk 1 “J2” Port	ASM 5 “IN Port”	2-1
2FEP DECtalk 2 “J2” Port	ASM 6 “IN Port”	2-2
2FEP DECtalk 3 “J2” Port	ASM 7 “IN Port”	2-3
1FEP DECtalk 5 “J2” Port	ASM PB1 “IN Port”	1-5
2FEP DECtalk 5 “J2” Port	ASM PB2 “IN Port”	2-5

2.5 Operational and Spare ASC Jumper Setting and Cable Installation

1. Disconnect five DECtalk-ASC audio cables (labeled as 4-1, 4-2, 4-3, and 4-5).
2. Disconnect the two ACP-ASC audio cables.
3. Disconnect the ASC-4BKUP parallel port interface cables.
4. Disconnect the two ACP-ASC control cables.
5. Loosen the four front panel screws and extract the ASC card.
6. Refer to figure 1. On both the operational and spare ASC, set the backup channel configuration by positioning the seven jumpers on JP1. Using all seven jumpers, move the jumpers to the side of the block that lists the number of output channels for your site configuration (the center row of pins is common). For example, if your site has 5, 6, 9, or 10 channels, connect each jumper from the center pin to the top pin; if your site has 1, 2, 3, 4, 7, 8, 11, 12, or 13 channels, connect each jumper from the center pin to the bottom pin.

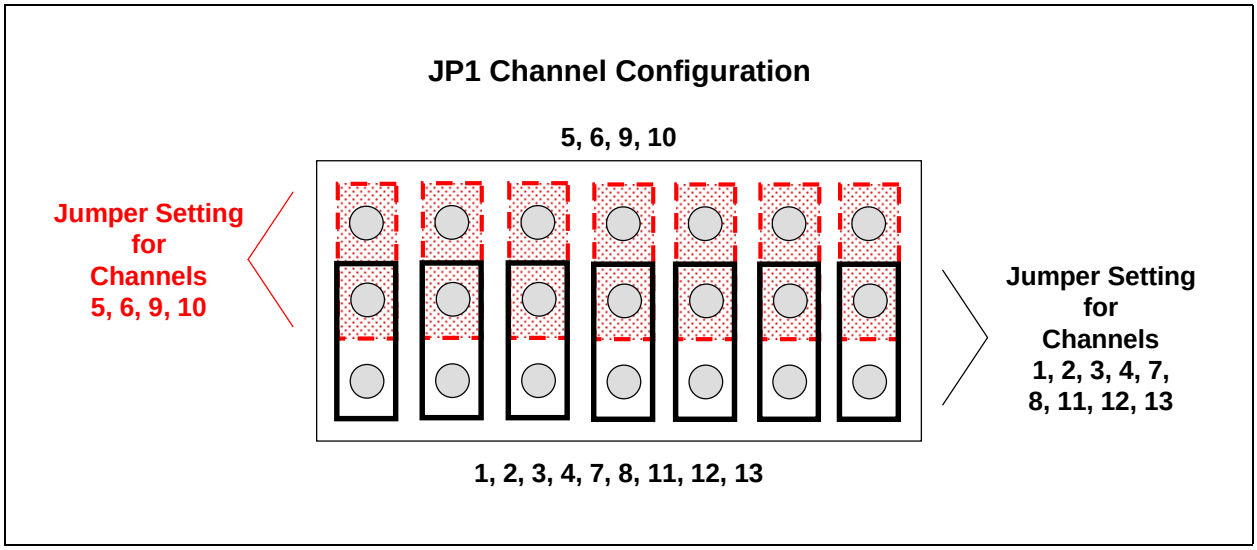

Figure 1. ASC Card Jumper Block (JP1)

7. Insert the ASC back into the ASA and tighten the four front panel screws.
8. Reconnect the two ACP-ASC control cables.
9. Reconnect the ASC-4BKUP parallel port interface cable.
10. Reconnect the two ACP-ASC audio cables.
11. Reconnect existing DECtalk-ASC audio cables on 4BKUP according to table 4.

Table 4. DECtalk to ASC Audio Cables

From	To	Cable Label
4BKUP DECtalk 1 “J2” Port	ASC “BKUP Audio 1” Port	4-1
4BKUP DECtalk 2 “J2” Port	ASC “BKUP Audio 2” Port	4-2
4BKUP DECtalk 3 “J2” Port	ASC “BKUP Audio 3” Port	4-3
4BKUP DECtalk 4 “J2” Port	ASC “BKUP Audio 4” Port	4-4
4BKUP DECtalk 5 “J2” Port	ASC “BKUP Audio 5” Port	4-5

2.6 New Transmitter Audio Output Cable Installation

1. Connect the OUT1 port of the new ASM card at slot 7 of the ASA chassis by installing the new audio output cable to the Demarc Panel position for the new transmitters.
2. Install the new NWRSAME (if available) to the top panel of the 5MP workstation (if available).
3. Install the NWRSAME-ACP interface cable from the NWRSAME rear connector to the “NWRSAME INPUT 1” port of ACP2 rear panel; this connects to pins 2, 6, 7, 9, and 10 of the NWRSAME (if available).

This completes the hardware modification.

PART 3 - CRS POWER-UP PROCEDURES

CAUTION

Before powering up the FEPs, you must perform the *New Configuration Physical Verification* procedure contained in attachment C to verify proper system configuration. Failure to perform the procedure can result in transmitter broadcasts assigned to incorrect output channels.

3.1 Power-Up FEP

1. Press the **ON/OFF** switch (on the front center right of each enclosure) to power-up the FEPs. A green power LED on each FEP lights, indicating the power is on. The FEPs can be powered-up in any sequence. The FEPs go through a memory check, display the system configuration [as recognized by the basic I/O system

(BIOS)], and boot the embedded operating system. At the completion of the boot process, the console screen displays the prompt:

Console Login:

The embedded operating system automatically initializes to a pre-set level and then waits for final start-up commands from the master MP.

NOTE: The FEPs share a common console through the *Shared Monitor Switch*. The console displays messages while completing the boot process of the FEP currently switched in.

2. Use the *Shared Monitor Switch* to select the next **FEP**. The prompt displays:

   Press <F1> to resume, <F2> to Setup.

3. Press **F1** to complete the boot process. The console monitor displays:

   Console Login:

4. Repeat for each remaining FEP.

3.2 Power-Up Main Processors

NOTE: 1. Power-up 0MP as the master main processor and 5MP as the shadowing processor.

Press the **ON/OFF** switch (on the front center right of the enclosure) to power-up the FEPs. A green power LED on each MP lights, indicating the power is on. The MPs can be powered-up in any sequence. The MPs go through a memory check, file system check, system configuration verification (as recognized by the BIOS), and boot the embedded UNIX operating system. At the completion of the boot process, the workstation monitor displays the CRS Login screen. The MPs are now ready for the initialization of the CRS application software.

NOTE: 2. Following power-up, CRS displays the *Security Screen*. To continue login, click **Acknowledge**.

3. Whenever the MPs are powered-up, they automatically step through the boot process to the multiuser mode without operator intervention.

PART 4 - CRS LOGIN, APPLICATION SOFTWARE ERROR VERIFICATION, AND TEST DATABASE ASCII FILE LOADING PROCEDURES

4.1 CRS Login

NOTE: 1. Following power-up, CRS displays the *Security Screen*. To continue login, click **Acknowledge**.

2. The *CRS Login Screen* allows you to log onto CRS. This screen contains two fields: *Login ID* and *Password*. The fields are provided to allow you to type in your assigned login ID and password.

1. Type **admin** (for system administrator) in the *Login ID* field and press **<Enter>**. The cursor moves to the *Password* field.
2. Type your assigned password and press **<Enter>** to complete the CRS login process. The system displays the *CRS main* display. In addition, the system displays the following error message:

   System is not operational. Perform 'Start CRS' to start system.
3. Click **OK** to clear the message.

NOTE: 3. The error message is only a status message indicating that CRS is not running.

4.2 CRS Application Software Installation Error Verification

1. Open a *UNIX Shell*.
   a. Click **Maintenance.**
   b. Click **UNIX Shell.**
2. Type **grep ERROR /crs/install.log** and press **<Enter>**.
3. Ensure there are no error messages. Any error messages must be reported to CRS Site Support Staff at 301-713-0191 x145 or x144.
4. Type **grep WARNING /crs/install.log** and press **<Enter>**.
5. Ensure there are no error messages. Any error messages must be reported to CRS Site Support Staff at 301-713-0191 x145 or x144.

NOTE: Ignore any IP address error messages.

6. Type **Exit** at the prompt and press **<Enter>** to close the *UNIX Shell*.

4.3 CRS Test Database ASCII File Loading

NOTE: 1. The following instructions for loading the CRS test database ASCII file assume everything is being done with 0MP set as the MP.

1. Open a *UNIX Shell*:
   a. Click **Maintenance.**
   b. Click **UNIX Shell.**
2. Place the diskette with CRS test database ASCII files in the 0MP diskette drive to copy the desired file from the diskette to CRS.
   a. Type **mdir a:** and press **<Enter>** to display a directory listing of the files on the test database diskette. There are 13 files on the diskette with the following filename convention:
   TYP*W*_CFG.ASC where *W* = 1 - 4
   LRG*X*_CFG.ASC where *X* = 5 - 8
   MAX*Y*_CFG.ASC where *Y* = 9
   MAX*Z*_CF.ASC where *Z* = 10 - 13
   (*W*, *X*, *Y*, and *Z* represent the number of channels supported by your CRS)
   b. Locate the applicable test database ASCII file.
   c. Type **mcopy a:*filename* /crs/data/SS/*filename*** (where *filename* is the name of the CRS test database ASCII file to be used).
   d. Press **<Enter>**.
3. Click and hold the left mouse button on any white space, move the cursor to select **XCRS_SITE Utility,** and release the button to bring up the *XCRS_SITE Utility* window.
4. Click the **Select ASCII Site Setup** button to bring up the list of ASCII files.
5. Select the desired database ASCII filename copied from the diskette in section 4.3, step 2c and double-click it.

NOTE: 2. The directory selection block has a default directory name of */crs/data/SS*; the file filter block has a default file name of */crs/data/SS/*.ASC*. If the desired filename does not appear, the file may have been copied to the wrong directory in section 4.3, step 2.c. Should this be the case, change the default directory name to the directory specified in section 4.3, step 2.c. Another reason the filename may not appear is that it may have been filtered out. UNIX is case-sensitive: If the file was copied with an ASC extension in lowercase, the filename will not display. In this case, change the filter filename to **/crs/data/SS/*.asc** and the filename will display.

6. Select **Initialize System Configuration** and **Database** to ensure the entire system database and configuration is erased and replaced.
7. Click the **Start Site Configuration** button. The system displays:

   Will now perform FULL site reconfiguration. Continue?
8. Click **OK**. The "wristwatch" and the "working" message display. Several messages scroll by. The last message reads:

   Finished with site configure.

   The "wristwatch" and "working" message disappear. Ensure there are no error messages at the completion of the site configuration process.
9. Restart CRS by clicking **Start CRS System**. The system displays:

   The CRS system will be STARTED. Continue?
10. Click **OK**. The "wristwatch" and the "working" message display. Several messages scroll by. The last message refers to starting 4BKUP. The "wristwatch" and "working" message disappear.
11. Click **Exit** to close the *XCRS_SITE Utility* window.
12. Click the *UNIX Shell* window to select it. At the prompt type **Exit** and press **<Enter>** to close the *UNIX Shell*.
13. Open the *System Status* window.
    a. Click **System**.
    b. Click **System Status**.
14. Monitor the *System Status* window and ensure the system is operational.

PART 5 - POST HARDWARE EXPANSION CHANNEL OPERABILITY VERIFICATION PROCEDURES

5.1 Channel Operability Verification

NOTE: The CRS test database ASCII files contain test messages configured for continuous broadcast for channel operability verification.

1. Connect a monitor speaker or headphones to the ACP.
2. Using the *Channel Select* control, select each channel, one at a time. Monitor the output for the correct message (i.e., with *Channel one* selected, the message output is: *This is transmitter one, audio switch module one*).

5.2 FEP Backup Mode Channel Operability Verification

1. Click **Maintenance**.
2. Click **Front-End Processor Switch**.
3. Select **3** in the *Front-End Processor Switch* window under *FEP*.
4. Select **Out** under *Switch*.
5. Select **Yes** under *Backup*
6. Click **Save the current record** to execute the FEP switch process. The *Question* window displays:

   Switch out the FEP FULLY offline ???

7. Click **OK** to continue. The system displays the “wristwatch” and the message:

   Requesting FEP Switchout.

8. Monitor the *3FEP* and *4BKUP* system status icons to verify that the *3FEP* icon is in backup mode and the *4BKUP* icon displays the online status.
9. Upon completion of the FEP switch process, repeat section 5.1, steps 1 and 2.
10. Upon completion of the FEP backup mode channel operability verification, perform the following to display the *Front-End Processor Switch* window:
    a. Click **Maintenance**.
    b. Click **Front-End Processor Switch**.
11. Select **3** in the *Front-End Processor Switch* window under *FEP*.
12. Select **IN** under *Switch*.
13. Click **Save the current record** to execute the FEP switch process. The system displays the “wristwatch” and the message:

    Requesting FEP switch-in...

14. Monitor the *3FEP* and *4BKUP* system status icons to verify that the *3FEP* icon is online and the *4BKUP* icon displays the backup mode status.
15. When the system returns to normal operation, perform the following steps to close the *Front-End Processor Switch* window and stop CRS:
    a. On the *Front-End Processor Switch* window:
       (1) Click **File**.
       (2) Click **Exit**.
    b. On the *Main CRS* menu:
       (1) Click **System**.

(2) Click **Stop System**.

(3) Click **OK**.

(4) Click **Close**.

16. Monitor the *System Status* window and verify the CRS application has stopped.

PART 6 - ADDING NEW TRANSMITTER CHANNELS AND EDITING SITE DATABASE ASCII FILE PROCEDURES

6.1 Adding New Transmitter Channels

1. Click and hold the left mouse button on any white space. Move the cursor to select **XCRS_SITE Utility,** and release the button to bring up the **XCRS_SITE Utility** window.
2. Click the **Select ASCII Site Setup** button to bring up the list of ASCII files.
3. Select the current site database ASCII file and double-click it.
4. Click the **Add Transmitter(s)** button to start the **addxmt** program. It displays how many channels currently are available, the next available channel to be added, and the appropriate processor and slot.
5. Use the following steps to add a new transmitter to the *Site Database ASCII* file:

   a. Mnemonic

      (1) Type option number **1**, and press **<Enter>** to select the *Mnemonic*.

      (2) Type **a** and press **<Enter>** at the program prompt to add the *Mnemonic*.

      (3) Type **mmmmm** and press **<Enter>** (where *mmmmm* is the desired *Mnemonic*), up to a length of 5 characters. The program returns the *Mnemonic*.

      (4) Type **0** or press **Tab** and press **<Enter>** to complete the *Mnemonic* selection.

   b. Call Sign

      (1) Type option number **2** and press **<Enter>** to select the *Call Sign*.

      (2) Type **a** and press **<Enter>** at the program prompt to add the *Call Sign*.

      (3) Enter the **Call Sign** in the same manner as the *Mnemonic*, up to a length of 5 characters. The program returns the *Call Sign*.

      (4) Type **0** or press **Tab** and press **<Enter>** to complete the *Call Sign* selection.

   c. Frequency

(1) Type option number **3** and press **<Enter>** to select *Frequency*. The *Frequency* option only allows a selection of one of the seven choices listed.

(2) Type **n** and press **<Enter>** (where *n* is the desired *Frequency* choice). The program returns the *Frequency* choice by displaying an asterisk next to the *Frequency* selection.

(3) Type **0** or press **Tab** and press **<Enter>** to complete the *Frequency* selection.

d. Location

(1) Type option number **4** and press **<Enter>** to select *Location*.

(2) Type **a** and press **<Enter>** at the program prompt to add the *Location*.

(3) Enter the **Location** (in the same manner as the *Mnemonic* and the *Call Sign*) up to a length of 40 ASCII characters. The program returns the *Location*.

(4) Type **0** or press **Tab** and press **<Enter>** to complete the *Location* selection.

e. Add Transmitter

(1) Type option number **5** and press **<Enter>** to use all the parameters defined in the first four steps to configure a new channel in the database ASCII file. The program verifies that a new channel is really needed.

(2) Type **y** and press **<Enter>**. The program returns the assignment of each channel to its proper processor and slot. The program tells you the appropriate database ASCII file has been updated and the original has been saved with the .SAV extension.

6. The program then asks if another channel is needed. If an additional channel is needed, repeat steps **5 a** through **e** to add the next new transmitter. If not, type **n** and press **<Enter>** to exit the program.

6.2 Editing the Site Database ASCII File

1. When exit **addxmt** is done, the *Question* box displays:

   Ready to recompile selected ASCII file. Continue?

2. Click **Cancel** to close the *Question* box.

3. Select **Initialize System Configuration and Database** to ensure the entire system database and configuration are erased and replaced.

4. Click **Start Site Configure**. The *Question* box displays:

   Will now perform FULL site reconfiguration. Continue?

5. Click **OK** to recompile the database ASCII file. Upon completion of the database ASCII file recompile process, the system displays:

   Finished with site configure.

6. Restart CRS by clicking **Start CRS System**. The system displays:

   The CRS system will be STARTED. Continue?

7. Click **OK**. The "wristwatch" and the "working" message display. Several messages scroll by. The last message refers to starting 4BKUP and the "wristwatch" and "working" message disappear.

8. Click **Exit** to close the *XCRS_SITE Utility* window.

9. Open the *Alert Monitor* window.

   a. Click **System**.

   b. Click **Alert Monitor**.

NOTE: No attempt is made by **addxmt** to establish station identifiers, broadcast programs, broadcast suites, message types, voice parameters, keep alive messages, interrupt messages, etc., for the new channels. These must be configured through the CRS graphical user interface (see the *CRS Site Operator's Manual*) and updated in the site database ASCII file.

PART 7 - CRS SYSTEM ALIGNMENT PROCEDURES

NOTE:
1. In the following sections, ***all*** procedures must be performed, but ONLY for the added transmitters, i.e., added ASM cards, ***NOT starting from channel one***.
2. The CRS System Alignment is complex and requires two people.
3. Before proceeding, read the entire Part 7, CRS System Alignment Procedures, to gain a thorough understanding of the system alignment.

7.1 Introduction

The console replacement system (CRS) has two major operational functions:

- normal operation
- Backup Live (BUL)

Normal Operation - For normal operation, the CRS requires all MPs, FEPs, the ACP, and the ASA to work together. The DECtalk cards residing in the FEPs are used to generate all required audio outputs including the NWRSAME tones, the CRS alert tone (1050 Hz), transmitter transfer tones, and, when the Voice Improvement Processor (VIP) is inoperative, the CRS synthesized

voice. Live voice is input through a microphone and voice processor, and then digitized by an analog-to-digital converter (ADC) card residing in the MP. The digitized voice is then converted to an analog output by the DECtalk cards. The analog output from each DECtalk card is sent to a dedicated ASM card as the final CRS output for each audio channel. During normal operation, the VIP produces the CRS synthesized voice. The audio output from the VIP is controlled by the VIP application software through the graphical user interface (GUI). The audio output levels from the DECtalk cards are controlled by the CRS application software through the GUI to adjust the alert tone amplitude, transmitter transfer tone amplitude, NWRSAME tone amplitude, and voice volume.

Backup Live Operation - During BUL, the CRS uses only the ACP and the ASA. All the MPs and FEPs are bypassed during BUL. The ACP is used to generate the alert tone and the transmitter transfer tones. The external NWRSAME (B343-1) ECR-200 is used to generate the NWRSAME tones during BUL. Live voice (live microphone) is input through a microphone, a voice processor, and sent through the ACP and the ASA without any digitization. During BUL, the alert tone level is controlled by a tone volume control located at the front upper left corner of the ACP, and the level of the NWRSAME tones is controlled by a gain control potentiometer on the circuit board at the rear of the NWRSAME. The “Live Voice” output level, in either normal operation or BUL, is controlled by a microphone volume control located in the front lower central area of the ACP.

NOTE: The output level of live voice and recorded voice is controlled by the microphone volume Mic. control on the front of the ACP. When the index mark of the microphone volume control knob is set to the Auto position (full CCW), voice volume is automatically adjusted by the Symetrix 425 Voice Processor. A positive detent is felt when this mode is selected. When the microphone volume control is not set to the Auto position, voice volume is manually controlled. Voice output level is displayed using the VU meter on the front of the ACP.

7.2 Set-up Procedures for the AM-48 Test Set

1. Power on the AM-48 Test Set using the rocker switch (upper right side).
2. Set the **AM-48 Test Set** controls as indicated in table 5. (Refer to the *AM-48 Instruction Manual* and/or *Appendix J* of the CRS Maintenance Manual for further explanations on setup.)

Table 5. AM-48 Test Set Controls Setup

Function	Left Side of Test Set
Volume	Mid position
MON RCV, MON SND, Talk Switch	Mid position
Term, BRDG	Term
TONE, PULSE, ON HK	TONE
900-ohm, 600-ohm	600-ohm

Table 5. AM-48 Test Set Controls Setup (Continued)

Function	Left Side of Test Set
2w, 4w, 4w REC	2w
	Right Side of Test Set
ABS, REL, SEND	ABS
DAMP, OFF	OFF
SEL Filter	C-MSG (Displayed at bottom of LCD reader) (Printed on bottom of display)
SEL MEASURE	L/F (Printed on bottom of display)
SEL SEND	Quiet (Printed on bottom of display)
MF, DTMF, SHIFT	DTMF
SF SKP, NOR, X TONE	NOR
RCL/STC, PRINT	Mid position

3. When performing any of the following alignments, the system output at the ASM card to the transmitter/channel under test must be disconnected and terminated into the AM-48 test set. The AM-48 must be set to the 600-ohm internal terminator. If the ASM card for a channel is using both audio outputs to different transmitters, then the other output needs to be terminated into a 600-ohm load. If the second output is connected to something else (i.e., music on hold for the phone system) then leave it connected while performing alignment.
4. The OUT1 and OUT2 jacks on the ASM card front panel are not isolated from each other. Using a second output affects the output of the first (i.e., connected to music on hold for the phone system). If the load on the ASM card is increased, the audio output level decreases.
5. Connect the RJ-11 cable to the 4W RCU jack on the bottom of the AM-48.
6. Remove the transmitter feed output RJ-11 plug from the selected ASM card output jack.
7. Connect the AM-48 Test Set to the ASM card output jack corresponding to all transmitters being fed by channel under test.

7.3 Alignment Approach

7.3.1 General

Each ACP has a factory calibrated volume unit (VU) meter on the front. The VU meter is used to monitor the following signals:

1. Alert tone and transmitter transfer tone generated by the ACP during BUL.
2. NWRSAME tone generated by the NWRSAME panel during BUL.

3. Playback signal from the selected ASM card during “normal operation”.

During normal operation, signals from the DECtalk cards are sent through the dedicated ASM cards for final output. During BUL, tones generated by both the ACP and NWRSAME are sent through the ACP, ASC, and to selected ASM card(s) for final output. Each audio output channel has one dedicated ASM card having a 12 turn transmitter channel gain control potentiometer to control the final output gain in both normal operation and BUL. Each ASM card is aligned by adjusting the transmitter channel gain control potentiometer. After alignment is completed, the transmitter channel gain remains fixed and should require no further adjustment unless the card is replaced.

7.3.2 Playback and Normal Audio Output Levels

The ASM card’s playback signal level is different from its final output signal level. This is because the playback signal level is sampled before the transmitter channel gain control potentiometer, and the final output signal level is sampled after the transmitter channel gain control.

NOTE: When monitoring a channel (NOT USING BUL) the ACP VU meter does not monitor the final output of the ASM card. The amplitude of the monitored signal (from the VU meter) is 1.2 higher than the amplitude of the final output of the ASM card (i.e., the 1050 Hz Alert Tone). When the ASM card’s final output amplitude is set to 0 dBm (using the AM-48 Test Set), the VU meter reading should indicate a level of + 1.2 (± 0.5). Therefore, the VU meter can be used to measure the output level in conjunction with the AM-48 Test Set.

7.3.3 Tone Volume Control

When the tone volume control knob’s index mark is set to the *Ref* position, the output level of ACP generated tones are set at 0 dBm. Since the tone volume control knob does not have a detent associated with the *Ref* position, the operator may not know whether the tone volume control is accurately set.

The fixed *Ref* mark arrow on the ACP front tone control is only the starting point for the alignment procedure. After completing the alignment, the new index mark on the tone knob may or may not end up aligning with the *Ref* arrow on the ACP front panel. The position where the tone knob index mark ends up at the end of this alignment is the position it is to remain during normal operation.

7.3.4 Transmitter Channel Gain Control

The transmitter channel gain control on an ASM card is a 12-turn potentiometer, adjusted by using a small jeweler’s screwdriver through the ASM card front panel. Turning the gain control clockwise increases the output level to a maximum of **3.5** dB into a 600-ohm load (when fully clockwise).

All other adjustments are done on a "setup only basis" using the GUI. Associated setups are made using recommended values and require no further alignment effort. The associated gains are set to suggested values using the GUI for DECtalk generated outputs (such as the alert tone, transmitter transfer tones, NWRSAME tones, and synthesized voice). For the ACP generated outputs (such as the alert tone and transmitter transfer tones), the tone volume control knob on the front upper left corner of the ACP is set to the *Ref* position.

NOTE: ***During the following alignments in sections 7.4, 7.5, and 7.6, CRS remains operational. However, the audio to each transmitter being tested will be interrupted while that channel is being aligned.***

7.4 Backup Live Alignment Procedures

Three alignments need to be made on the CRS. These alignments should be performed in the following sequence:

1. ACP Ref Mark Alignment
2. ASM Card Alignment
3. NWRSAME Alignment

During BUL, alert and transfer tones are generated by the ACP and NWRSAME tones are generated by the NWRSAME panel. Reference table 6, *Tone Frequencies, Tolerances, and Duration* as necessary for the following alignments.

Table 6. Tone Frequencies, Tolerances, and Duration

Tone Type	Frequency	Tolerance	Duration	Tolerance
Primary to Secondary Transfer	1800 Hz followed by 2400 Hz	± 5 Hz ± 5 Hz	5 sec. 5 sec.	± 0.5 sec. ± 0.5 sec.
Secondary to Primary Transfer	2400 Hz followed by 1800 Hz	± 5 Hz ± 5 Hz	5 sec. 5 sec.	± 0.5 sec. ± 0.5 sec.
Alert Tone 1	1050 Hz	± 0.3%	10 sec.	± 2 sec.
Alert Tone 2*	1200 Hz	± 0.3%	10 sec.	± 2 sec.
Alert Tone 3*	1350 Hz	± 0.3%	10 sec.	± 2 sec.
Alert Tone 4*	1500 Hz	± 0.3%	10 sec.	± 2 sec.
Alert Tone 5*	1650 Hz	± 0.3%	10 sec.	± 2 sec.

* Not currently used–reserved for future use.

NOTE: 1. This alignment requires two people: one in the operations room, and one in the equipment room.

Make copies of table 8 (last page in Part 7) in order to fill in the initial and final value measurements for the alignments below. The data will be used for alignment verification and reference for future alignments. Print out sufficient copies of the table to equal the number of ASM cards installed.

When performing the following BUL Procedures, it is optional to disable the transmitter, under the Transmitter Configure Menu, that is being aligned. This prevents unwanted silence alarms in operational areas.

If there is still a problem with reception of the NWR broadcast voice, alert tone, or NWRSAME messages or the correct audio level/modulation cannot be obtained at the transmitter after performing all the below procedures (7.4.x through 7.6.x) plus the NWR Transmitter Preventive Maintenance Schedule procedures (Maintenance Note 56), the NWR System Alignment (End-to-End) procedures (Maintenance Note 57) must be performed to determine the source of the problem.

The following equipment is required:

1. Ameritec AM-48 Transmission Test Set to read the audio signal level
2. Small jeweler's screwdriver
3. RJ-11 phone cable (approximately 6 feet)

NOTE: 2. The ACP Ref mark alignment must be done by site personnel. Both the ASM card alignment and NWRSAME alignment ***cannot*** be performed until the ACP Ref mark alignment is done.

7.4.1 ACP Ref Mark Alignment

1. Verify that the **AM-48 Test Set** is properly setup and connected to the ASM card according to section 7.2.
2. Position the ACP **Channel Select** knob to **Transmitter 1.**
3. On table 8 under "Before Adjustment" in the "On | Above | Below Mark" block, circle the current ACP *Tone* volume control knob position relative to the *Ref* arrow (On, Above, or Below). Align the index mark on the front of the ACP *Tone* knob with the **Ref** position arrow.
4. To start BUL on Channel No.1, push the **Transmitter Select 1** button and the **Transmitter Select Enable** button in sequence. These controls are in the *BACKUP LIVE* area on the front of the ACP.
5. Push the **Transfer/Alert Tones 1** button to cause the ACP to generate the 1050 Hz alert tone. The duration of the 1050 Hz alert tone is 10 seconds.
6. Observe the VU meter on the ACP front panel. It should indicate **0** on the red scale.

7. If the VU meter does not indicate a reading of **0**, adjust the **Tone** volume control until that level is obtained.

8. Repeat steps 5, 6, and 7 until a reading of **0** is obtained. When the *Tone* volume control is set to the true reference position, the ACP provides the selected alert tone level of 0.

NOTE: If the final position does not coincide with the fixed ACP *Ref* arrow, a nonpermanent mark (tape, sticker, etc.) can be made on the panel of the final alignment position so operators do not incorrectly change the tone knob back to align with the Ref arrow. Do NOT deface the front of the ACP with any kind of permanent marking!

9. Make sure to keep the Ref position as aligned in this procedure. Do not change this position unless another alignment is needed. Place a note to inform the operators not to touch the knob. On table 8 under “Final Reading” in the “On | Above | Below Mark” block, circle the final ACP *Tone* knob position relative to the fixed *Ref* arrow (On, Above, or Below).

10. To stop BUL, push the **Transmitter Select Enable** button and the **Transmitter Select 1** button in sequence.

7.4.2 ASM Card Alignment

Alignment Procedures

1. Verify that the **AM-48 Test Set** is properly setup and connected to the ASM card according to section 7.2.

2. Ensure the index mark on the *Tone* volume control knob is set to the reference position as determined in section 7.4.1, *ACP Ref Mark Alignment* procedure.

3. Position the ACP **Channel Select** knob to **1** (Transmitter 1).

4. Start BUL on ASM output channel No.1 by pushing the **Transmitter Select 1** button and the **Transmitter Select Enable** button in sequence. These buttons are located in the *BACKUP LIVE* block area on the front of the ACP.

NOTE:
1. The alert tone output from the ACP lasts only 10 seconds. It is recommended a second person push the **Alert Tone 1** button for a near continuous tone output. This smooths out the calibration effort and minimizes the time required.
2. During BUL, the VU meter monitors the ACP tone output, not the output of the ASM card. The ACP tone output is sent to the ASM card by way of the ASC for final output.

5. Push the **Transfer/Alert Tones 1** button to send an alert tone to the ASM card No. 1 output. Record the initial AM-48 reading in table 8.

6. Using a small jeweler's screwdriver, adjust the transmitter gain control potentiometer through the small hole in the ASM front panel (located above the **In** jack) until a reading of **0** dBm (as close to 0 dBm without going positive) is measured on the AM-48 Test Set.
7. Repeat steps 4, 5, and 6 until a reading of **0** dBm is obtained. Record the final reading in table 8.
8. Push the **Pri/Sec** transmitter transfer tone button to send out 5 seconds of 1800 Hz tone followed by 5 seconds of 2400 Hz tone.
9. Verify a reading of 0 dBm (± 1.5 dBm) on the AM-48 Test Set for the *Transfer Tones*. Record the final reading in table 8.
10. Push the **Sec/Pri** transmitter transfer tone button to send out 5 seconds of 2400 Hz tone followed by 5 seconds of 1800 Hz tone.
11. Verify a reading of 0 dBm (± 1.5 dBm) on the AM-48 Test Set for the *Transfer Tones*. Record the final reading in table 8.
12. To stop BUL, push the **Transmitter Select Enable** button and then the **Transmitter Select 1** button in sequence.
13. Repeat steps 1 through 12 to align each of the other ASM cards in the system. Each ASM card output is activated by selecting the appropriate transmitter on the **Channel Select** knob and by pushing the respective **Transmitter (number)** button and then the **Transmitter Select Enable** button. ASM card 1 corresponds to Transmitter 1, and ASM card 2 corresponds to Transmitter 2, etc.

7.4.3 NWRSAME (ECR-200) Panel Calibration

NOTE: 1. When performing the following calibration, the system output of the ASM card must be disconnected, and the AM-48 Test Set connected in its place. Refer to the AM-48 set up in section 7.2.

The NWRSAME (ECR-200) calibration must be performed by site personnel.

A small screwdriver is required to adjust the NWRSAME gain control potentiometer.

Calibration Procedures:

NOTE: 2. The front panel key sequence on the NWRSAME for a continuous NWRSAME preamble tone output is TEST and then SEND. Pressing the CANCEL key stops the sequence.

1. Verify that the **AM-48 Test Set** is properly setup and connected to the ASM card according to section 7.2.

2. Ensure the *Tone* volume control knob is set to the index mark as determined in section 7.4.1, *ACP Ref Mark Alignment* procedure.
3. Position the ACP **Channel Select** knob to **1** (Transmitter 1).
4. Start BUL on ASM output channel No.1 by pushing the **Transmitter 1** button and the **Enable** button in sequence. These are located in the *BACKUP LIVE* block area on the front of the ACP.
5. Initiate a continuous NWRSAME preamble tone output from the NWRSAME panel by pressing the **TEST** key once and then the **SEND** key.
6. Located at the back of the NWRSAME panel next to the terminal block is the output gain control potentiometer. Observe and record the initial AM-48 Test Set reading (in table 8), then adjust the gain control potentiometer for a reading of - 4.5 dBm ± 0.5 dBm on the AM-48. Record the final AM-48 reading.
7. The levels for voice, warning tone, and SAME messages have been selected to optimize detectability by a receiver. This maximizes the transmitter modulation deviation without causing distortion. The levels selected herein presume frequency response of the telecommunications line to the transmitter is relatively flat and the pre-emphasis circuit in the transmitter is within 1.0 to 2.0 dB of the required 6.0 dB per octave. If these presumptions are not correct, measurements at the audio input at the transmitter site on a case by case basis may be necessary to obtain the optimum modulation (corresponding to a deviation of 4.5 kHz for the NWRSAME tones). ***These transmitter audio level measurements are made during the regular transmitter preventive maintenance interval (see Maintenance Note 56). If the correct audio level/modulation cannot be obtained at the transmitter after the CRS system alignment and periodic preventive maintenance interval are performed, the NWR System Alignment (End-to-End) procedures (Maintenance Note 57) must be performed to determine the source of the problem.***

NOTE: 3. The output gain potentiometer is the only control on the back panel of the NWRSAME. Adjustment of the control is very sensitive because it is a single turn potentiometer.

8. Push the **CANCEL** key on the NWRSAME to stop the generation of the preamble.
9. Push the **Enable** button and **Transmitter 1** button in sequence to stop BUL.

7.5 Voice Processor Setup

The ACP contains a voice processor to provide automatic gain control (AGC) of the input voice. The voice processor is located at the back of the ACP. The setup of the voice processor is important because it affects the quality and output level of the live voice. However, it does not affect any of the previous alignment processes.

7.5.1 Voice Processor Setup Procedure

Set the ACP microphone volume control (**Mic**.) to the **Auto** position and setup the Symetrix 425 Dual Compressor/Limiter/Expander Default Values (Voice Processor) as indicated in table 7:

NOTE:
1. The following setup is for the Shure SM2 Headset Microphone. The typical voice output level is between - 3.0 dBm and - 4.0 dBm. Use of a different microphone type may require a different setup for the voice processor.
2. If the microphone volume control is not set to the AUTO position, the voice processor ***will not*** provide AGC on the input voice.

Table 7. Symetrix 425 Dual Compressor/Limiter/Expander Default Values (Voice Processor)

Voice Processor Control	Default Setting
Channel 1	
Expander:	
Threshold	-7
Release	FAST
Compressor:	
Threshold	-20
Release	FAST
Ratio	10
Limit:	
Threshold	3
Out:	
Gain	6
In/Bypass:	IN
Channel 2	
Expander:	
Threshold	-7
Release	FAST
Compressor:	
Threshold	-20
Release	FAST
Ratio	10
Limit:	
Threshold	3
Out:	
Gain	6
In/Bypass:	IN

7.5.2 Microphone Background Noise Reduction (if required)

In the event the noise level around the operational area is too great and is picked up by the microphone, the following adjustments can be made to the Symetrix 425 Voice Processor to reduce background noise. Detailed information can be found in section 8.2, page 8-1 of the *Symetrix 425 Owner's Manual*.

1. Set the index mark on the microphone volume control knob on the front of the ACP to **Auto**.
2. When no one is speaking into the microphone, set the *EXPANDER THRESHOLD* for **-16 dB or more** (default threshold is -7 dB) to reduce the background noise.
3. Press the **MIC** button on the Audio Control Panel (located under the OPER volume control knob) to enable the headset microphone.
4. When speaking into the microphone, set the *EXPANDER THRESHOLD* for **0** peak on the ACP VU meter.
5. Set the *EXPANDER RELEASE* to **FAST**.

7.6 CRS Alignment Procedures for Normal Operation Using the *WRSAME Tone Generator* (to match BUL Alignment)

During normal operation, all audio output levels from the DECtalk cards are controlled by the CRS Application. The off-line tone generator application, *WRSAME Tone Generator* provides the ETs the capability to force tones repeatedly without having to schedule messages since the current tones (NWRSAME, Alert, Transfer) are such a short duration. This utility also allows ETs, logged in as **ADMIN**, to modify the durations of the tones to facilitate amplitude adjustment, to backup the current tone settings, or to restore tones from the previous tone settings.

NOTE:
1. Do not put the CRS on-the-air while performing the following procedures.
2. When performing any of the following alignments, the system output at the ASM card to the transmitter/channel under test must be disconnected and terminated into the AM-48 test set. The AM-48 must be set to the 600-ohm internal terminator. If the ASM card for a channel is using both audio outputs to different transmitters, then the other output needs to be terminated into a 600-ohm load. If the second output is connected to something else (i.e., music on hold for the phone system), then leave it connected while performing alignment.
3. Any output amplitude changes, which were made through the GUI, will be permanently saved on the system disk once *Save Amplitude* is selected for the corresponding tone. When GUI changes are completed, a new Database Backup will need to be accomplished and a new ASCII file will need to be compiled and saved to a floppy. They will remain unchanged in the system unless the ADMIN operator makes another amplitude change, restores settings from the *WRSAME Tone Generator*, restores a backup database, or recompiles a new database.
4. This alignment requires two people: one in the operations room, and one in the equipment room.
5. In the event the 4BKUP processor has replaced one of the FEPs, the CRS software matches the DECtalk amplitude settings for the affected DECtalk cards of the replaced FEP.

The DECtalk card output level adjustment procedures in sections 7.6.2, 7.6.3, 7.6.4, and 7.6.5 MUST be performed on each and every DECtalk card output channel in the CRS. Remember, ACP channel select 1 corresponds to ASM card 1 and transmitter 1, channel select 2, corresponds to ASM card 2 and transmitter 2, etc.

Three adjustments to the DECtalk cards need to be made under the *WRSAME Tone Generator Menu*. The fourth must be made under the *Transmitter Configure* menu. These adjustments should be performed in the following sequence for each transmitter:

1. DECtalk NWRSAME Tone Output Level Adjustment
2. DECtalk Card Alert Tone Output Level Adjustment
3. DECtalk Transmitter Transfer Tone Output Level Adjustment
4. DECtalk Synthesized Voice Output Level Adjustment

The following equipment is required for these adjustments:

- Ameritec AM-48 Transmission Test Set
- RJ-11 phone cable (approximately 6 feet)

7.6.1 Restoring and Saving Settings for CRS Application Alignment

This is a part of the new features for Build 9.0, where alignment values can be backed-up or restored separate from the database.

1. ***Save Amplitude*** - Note the display of tone settings and the corresponding data values are not updated into the transmitter configuration until the *Save Amplitude* button is selected. This must be done ***before saving*** and ***after restoring any settings*** for each transmitter.
2. ***Restore Settings*** - This button will restore tone settings from a previously saved file for all transmitters. The default search pattern in the *file selection* box is set to */home/admin/*.dat*.
3. ***Save Settings*** - This button will backup the current tone settings for all transmitters to a file. The default search pattern in the *file selection* box is set to */home/admin/*.dat*. Therefore, save the filename with a ".dat" extension. This should be completed after performing the DECtalk NWRSAME Tone Output Level Adjustment, DECtalk Card Alert Tone Output Level Adjustment, and DECtalk Transmitter Transfer Tone Output Level Adjustment.

7.6.2 DECTALK Card SAME Tone Output Level Adjustment

NOTE: 1. Position the *ACP Channel Select* knob to correspond with the transmitter under adjustment.

1. Verify that the AM-48 Test Set is properly setup and connected to the ASM card according to section 7.2.
2. Select the **Transmitter** menu and then select **Transmitter Configure**. Select the ***Transmitter*** to be used for the alignment then click **Disable** in the *Status Section*. Click the **Save** hot key to change the transmitter status.
3. Click the **Exit** hot key (the large “X” in the upper right of the display) to close the *Transmitter Configure* window.
4. Click the **Maintenance menu** and then select **WRSAME Tone Generator**.

NOTE: 2. The *SAME Tone* operation window is a default window when the *Off-line Tone Generator* program starts up. It can also be selected by clicking the **Same Tones** button from the *CRS Tone Maintenance Utility* window. The possible data values associated with this window are as follows:

a. The SAME tone amplitude can be set from 1 to 99.

b. The SAME tone duration can be set from 1 to 30 seconds, ± 1 second.

c. The Save Amplitude button is used to dynamically update the amplitude level for the selected transmitter. The amplitude is saved in the transmitter configuration and downloaded to the appropriate DECtalk card.

5. In the *Choices* section under *Transmitters*, click on the **first transmitter** in the displayed list. The first transmitter name corresponds to ASM card 1, the next transmitter corresponds to ASM card 2, etc.

6. Adjust the **SAME Tone Duration** slider to the desired time in seconds.

7. Record the initial *SAME Tone Amplitude* slider setting in table 8.

8. Move the **SAME Tone Amplitude** slider to increase or decrease the SAME tone output amplitude, as necessary, to equal -4.5 dBm (± 0.5) on the AM-48 Test Set. A good starting point on the **SAME Tone Amplitude** is **6**.

9. Click the **Save Amplitude** button to save the new DECtalk card *Amplitude* settings.

NOTE: 3. After the *Save Amplitude* key is clicked, the new settings replaces the old values. The new DECtalk amplitude settings are downloaded to the associated DECtalk card. Downloading is instantaneous.

10. Click the **Start To Send** button to start the broadcast of the SAME tone.

11. Record the initial AM-48 Test Set reading in table 8.

12. Check that the measured output level of the DECtalk generated SAME tone equals - 4.5 dBm ± 0.5 dBm on the AM-48 Test Set. If the reading equals - 4.5 dBm (± 0.5 dBm) on the AM-48 Test Set, record the final AM-48 reading and final amplitude slider setting in table 8. Otherwise repeat steps 7 through 9.

13. When no other adjustments are necessary, select the **Transmitter** menu and then select **Transmitter Configure**.

14. Select the **Transmitter** and click **Enable** in the *Status Section*.

15. Click the **Save** hot key to change the transmitter status.

NOTE: 4. The levels for voice, warning tone, and SAME messages have been selected to optimize the detectability by a receiver. This maximizes the transmitter modulation deviation without causing distortion. The levels selected herein assume frequency response of the telecommunications line to the transmitter is relatively flat and the pre-emphasis circuit in the transmitter is within 1.0 to 2.0 dB of the required 6.0 dB per octave. If these assumptions are incorrect, measurements at the audio input at the transmitter site on a case by case basis may be necessary to obtain the optimum modulation (corresponding to a deviation of 4.5 kHz for the NWRSAME tones). ***These transmitter audio level measurements are made during the regular transmitter preventive maintenance interval (see Maintenance Note 56). If the correct audio level/ modulation cannot be obtained at the transmitter after the CRS system alignment and periodic preventive maintenance interval are performed , the NWR System Alignment (End-to-End) procedures (Maintenance Note 57) must be performed to determine the source of the problem.***

7.6.3 DECTALK Alert Tone Output Level Adjustment

NOTE: 5. Position the **ACP Channel Select** knob to correspond with the transmitter under adjustment.

1. Verify that the AM-48 Test Set is properly setup and connected to the ASM card according to section 7.2.
2. Select the **Transmitter** menu and then select **Transmitter Configure**. Select the ***Transmitter*** to be used for the alignment and click **Disable** in the *Status Section*. Click the **Save** hot key to change the transmitter status.
3. Click the **Exit** hot key (the large “X” in the upper right of the display) to close the *Transmitter Configure* window.
4. Click the **Maintenance** menu and select **WRSAME Tone Generator**.

NOTE: 6. The *Alert Tone* window can be selected by clicking the **Alert Tones** button from the *CRS Tone Maintenance Utility* window. There are five different types of alert tones that can be selected, and all the possible data values associated with this window are as follows:

a. The Alert tone amplitude can be set from 1 to 99.

b. The Alert tone duration can be set from 1 to 30 seconds, ± 1 second.

c. The Save Amplitude button is used to dynamically update the amplitude level or the selected transmitter. The amplitude is saved in the transmitter configuration and downloaded to the appropriate DECtalk card.

d. Alert Tone 1 is tone frequency at 1050 Khz.

e. Alert Tone 2 is tone frequency at 1200 Khz. (Not Used.)

f. Alert Tone 3 is tone frequency at 1350 Khz. (Not Used.)

g. Alert Tone 4 is tone frequency at 1500 Khz. (Not Used.)

h. Alert Tone 5 is tone frequency at 1650 Khz. (Not Used.)

5. In the *Choices* section under *Transmitters*, click the desired **Transmitter** in the displayed list. The first transmitter name corresponds to ASM card 1, the next transmitter corresponds to ASM card 2, etc.

6. Adjust the **Alert Tone Duration** to the desired time in seconds.

7. Record the initial *Alert Tone Amplitude* slider setting in table 8.

8. Move the **Alert Tone Amplitude** slider to increase or decrease the *Alert Tone* output amplitude, as necessary, to equal 0 dBm on the AM-48 Test Set [+ 1.2 (± 0.5) on the ACP VU meter]. A good starting point on the *Alert Tone Amplitude* is 15.

9. Click the **Save Amplitude** button to save the new DECtalk card *Amplitude* settings.

NOTE: 7. After the *Save Amplitude* key is clicked, the new settings replaces the old values. The new DECtalk amplitude settings are downloaded to the associated DECtalk card. Downloading is instantaneous.

10. Click the **Start To Send** button to start the broadcast of the Alert tone.

11. Record the initial AM-48 Test Set reading in table 8.

12. Check that the measured output level of the DECtalk generated Alert tone equals 0 dBm on the AM-48 Test Set [+ 1.2 (± 0.5) on the ACP VU meter]. If the reading equals 0 on the AM-48 Test Set, record the final AM-48 reading and final amplitude slider setting in table 8. Otherwise repeat steps 7-10.

13. When no other adjustments are necessary, select the **Transmitter** menu and then select **Transmitter Configure**. Select the **Transmitter** and click **Enable** in the *Status Section*. Click the **Save** hot key to change the transmitter status.

7.6.4 DECTALK Transmitter Transfer Tones Output Level Adjustment

NOTE: 1. Position the **ACP Channel Select** knob to correspond with the transmitter under adjustment.

1. Verify that the AM-48 Test Set is properly setup and connected to the ASM card according to section 7.2.
2. Select the **Transmitter** menu and then select **Transmitter Configure**. Select the **Transmitter** to be used for the alignment and click **Disable** in the *Status Section*. Click the **Save** hot key to change the transmitter status.
3. Click the **Exit** hot key (the large “X” in the upper right of the display) to close the *Transmitter Configure* window.
4. Click the **Maintenance** menu and then select **WRSAME Tone Generator**.

NOTE: 2. The *Transfer Tones* operation window can be selected by clicking the **Transfer Tones** button from the CRS *Tone Maintenance Utility* window. There are two options that users can choose: "Primary to Secondary" and "Secondary to Primary." If the "Primary to Secondary" option is selected then the program will output the primary tone followed by the secondary tone. The "Secondary to Primary" option generates tones in the reverse order. All possible data values associated with this window are as follows:

   a. The Transfer tones amplitude can be set from 1 to 99.
   b. The Transfer tones duration can be set from 1 to 30 seconds, ± 1 second.
   c. The *Save Amplitude* button is used to dynamically update the amplitude level for the selected transmitter. The amplitude is saved in the transmitter configuration and downloaded to the appropriate DECtalk card.
   d. Changing the transmitter mode from *Primary* to *Secondary* sends out an 1800 Hz tone followed by a 2400 Hz tone.
   e. Changing the transmitter mode from *Secondary* to *Primary* sends out a 2400 Hz tone followed by an 1800 Hz tone.

5. In the *Choices* section under *Transmitters*, click the desired transmitter in the displayed list. The first transmitter name corresponds to ASM card 1, the next transmitter corresponds to ASM card 2, etc.
6. Adjust the **Transfer Tones** duration slider to the desired time in seconds.

7. Record the initial **Transfer Tone Amplitude** slider setting in table 8.
8. Move the **Transfer Tones Amplitude** slider to increase or decrease the *Transfer Tones* output amplitude, as necessary, to equal 0 dBm on the AM-48 Test Set (+ 1.2 [± 0.5] on the ACP VU meter). A good starting point on the *Alert Tone Amplitude* is **15**.
9. Click the **Save Amplitude** button to save the new DECtalk card *Amplitude* settings.

NOTE: 3. After the **Save *Amplitude*** key is clicked, the new settings replaces the old values. The new DECtalk amplitude settings are downloaded to the associated DECtalk card. Downloading is instantaneous.

10. Click the **Start To Send** button to start the broadcast of the Transfer tone.

NOTE: 4. When monitoring a channel (NOT USING BUL) the ACP VU meter does not monitor the final output of the ASM card. The amplitude of the monitored signal (from the VU meter) is 1.2 higher than the amplitude of the final output of the ASM card (i.e., the 1050 Hz Alert Tone). When the ASM card's final output amplitude is set to 0 dBm (using the AM-48 Test Set), the VU meter reading should indicate a level of + 1.2 (± 0.5). Therefore, the VU meter can be used to measure the output level in conjunction with the AM-48 Test Set.

11. Record the initial AM-48 Test Set reading in table 8 for both frequencies.
12. Check the measured output level of the DECtalk generated transfer tones equals 0 .dBm on the AM-48 Test Set (+ 1.2 [± 0.5] on the ACP VU meter). If the reading equals 0 on the AM-48 Test Set, record the final AM-48 reading and final amplitude slider setting in table 8 for both frequencies. Otherwise repeat steps 7 through 10.
13. When no other adjustments are necessary, select the **Transmitter** menu and then select **Transmitter Configure**. Select the **Transmitter** and click **Enable** in the *Status Section*. Click the **Save** hot key to change the transmitter status.

7.6.5 DECTALK Synthesized Voice Output Level Adjustment

The *Voice Amplitude* setting has no affect on the voice level output but the following procedure will set it to a nominal 25. The output is controlled by the *Volume* setting in the *Voice Parameters*, which controls the audio level output of the DECtalk card. This adjustment is for messages converted from text to speech by the DECtalk card. The amplitude of messages converted by the VIP will be adjusted in the next section.

NOTE: 1. In order to facilitate this part of the alignment, it may be necessary to have the forecast staff send a product over to be converted by DECtalk only. This alignment is crucial, because if VIP fails then DECtalk converts all messages. Also, most offices have their Station ID and Time Announcement generated by DECtalk.

1. Select the **Broadcast Cycle** window under the *Transmitter* menu from the *CRS Main Menu* (see Section 3, Figure 28, of the *Site Operator's Manual*).
2. Click the first transmitter under the ***transmitters/playbacks*** section (left side of window).
3. To determine which message is currently being broadcast, observe the *Transmit Time* column. The last message highlighted in green is currently being broadcast. A message converted from text to speech by the DECtalk card has the product category and specific product designator (i.e., LFPGEN 1 1 as shown in Section 3, Figure 28, of the *Site Operator's Manual*) in the *message name* column. The station ID is a good one to use. Messages converted by the VIP or recorded manually should not be used for this part of the alignment. These will be adjusted later.
4. While a DECtalk converted message is playing, check the ACP VU meter to ensure that the peak deflection is approximately **0** ± 2. Record the initial reading in table 8. The VIP level will be adjusted in section 7.6.6.
5. Click the **Transmitters** menu then select the **Transmitter Configure** window (see Section 3, Figure 21, of the *Site Operator's Manual*).
6. Click **Amplitudes**.
7. Move the **Voice Amplitude** slider to **25**. (Has no effect on output level.)
8. Click the **OK** button to return to the *Transmitter Configure* window.
9. Click **Voice Parameters**.
10. Check the *Volume* slider. Record the initial reading in table 8.
11. If the measurement requires adjustment, go to step 12. Otherwise, record the final VU meter reading In table 8 and go to section 7.6.6.
12. Adust the **Volume** slider to increase or decrease the output level (**25** is a good starting point).
13. Click the **Save** hot key to save the new DECtalk synthesized voice amplitudes.

NOTE: 2. Clicking the **Save hot** key, downloads the new DECtalk amplitude settings to the associated DECtalk card and replaces the old values. Downloading time can range from one to several minutes depending on the size of the current broadcast message. The downloading process does not start until the end of the current broadcast message is reached.

14. Check the VU meter to ensure that the peak deflection is approximately **0** ± 2. Record the final VU meter reading in table 8.
15. If the measurement requires adjustment, repeat steps 12 through 14. Only the Volume slider control needs to be adjusted.
16. The DECtalk card output level adjustment procedures in sections 7.6.2, 7.6.3, 7.6.4, and 7.6.5 MUST be performed on each and every DECtalk card output channel in the CRS. Remember, ACP channel select 1 corresponds to ASM card 1 and transmitter 1, channel select 2, corresponds to ASM card 2 and transmitter 2, etc.

7.6.6 VIP Converted Files Amplitude/Volume Adjustment to Match DECtalk Synthesized Voice Output Level

The ability to adjust the volume and rate/speed of the individual English male and female and the Spanish male converted audio files sent back to CRS was added in build 3.0.1. A *Volume Control* slide bar and a *Rate/Speed Control* slide bar are located within the *System Settings* interface for each voice type. The version 3.0.1 setting (-4 dB attenuation relative to the amplitude created by the down sample routine) is the default setting. It is also important to note that *Volume Control* and *Rate/Speed Control* adjustments only affect CRS Audio (*.Pv*) files sent back to CRS and also affect the individual male and female voice types used.

NOTE: 1. The following procedure must be accomplished for each voice type (Tom, Donna, and Javier).

1. Select the **Broadcast Cycle** window under the *Transmitter* menu from the *CRS Main Menu* (see Section 3, Figure 28, of the *Site Operator's Manual*).
2. Click the **first transmitter** under the *transmitters/playbacks* section (left side of window).
3. To determine which message and voice type is currently being broadcast, observe the *Transmit Time* column. The last message highlighted in green is currently being broadcast. If the *Message Name* column has *VIP ID* in the name, it was converted by the VIP. Listen to the message being played to determine what voice type is being used.

4. While a VIP message is playing, check the ACP VU meter to ensure that the peak deflection is approximately **0** ± 2. Record the initial ACP VU meter reading in table 8 for the appropriate voice type.
5. If the measurement requires adjustment, then go to step 6. Otherwise, record the final VU meter value in table 8 and go to step 13.
6. On the VIP, select the **System Settings** button from the *VIP Main Menu*. The *System Settings* window displays.
7. If the VIP Application is running, a message window displays stating "NOTE: VIP is running. Any changes won't take hold until you press stop, then start on the main interface." Click **OK** to acknowledge the message.
8. Record initial values of volume sliders for all voice types in table 8.
9. Use the slide bar under the appropriate voice type to increase or decrease the amplitude of the *.Pv* file (this file is sent from VIP to Master MP). This only affects new messages of that voice type processed by the VIP computer.
10. Click **Save and Exit** on the *System Settings* window. This closes the window.
11. On the *VIP Main Menu*, click **stop**, then **start** to restart the VIP application.
12. Resend a product that is designated for conversion by VIP from AWIPS to CRS. Check the *Broadcast Cycle* on CRS to determine when the new message is playing. While the new message is playing, check the ACP VU meter to ensure that the peak deflection is approximately **0** ± 2.
13. If the measurement requires adjustment, then repeat steps 6 through 12. Otherwise, record the final VU meter value for that voice type. Record final values of volume sliders for all voice types in table 8 and go to step 14.
14. If necessary, repeat steps 1 through 13 for all appropriate voice types for your location. The VIP audio level adjustment affects only one of the voice types. This adjustment matches the *DECtalk Synthesized Voice Output Level* and the VIP converted files amplitude/volume.

NOTE: 2. At the completion of the Alignment procedures, disconnect the test equipment and return the system to normal operation.

7.6.7 Live Voice and Digitized Voice Output Level Adjustment

The output level of live voice and digitized voice is controlled by the microphone volume **Mic**. control on the front of the ACP. When the index mark of the microphone volume control knob is set to the **Auto** position, voice volume is automatically adjusted by the *Symetrix 425 Voice Processor*. A positive detente is felt when this mode is selected. When the microphone volume control is not set to the **Auto** position, voice volume is manually controlled. Voice output level is displayed using the VU meter on the front of the ACP.

7.6.8 Matching the CRS Outputs for BUL Operation

For BUL, the operator can adjust the **Tone** volume control on the front of the ACP to adjust the output level for the alert tones, transmitter transfer tones, and NWRSAME tones. During BUL, alert tones and transmitter transfer tones are generated by the ACP. NWRSAME tones are generated by the NWRSAME. The live voice output level is controlled by the **Mic** volume control on the front of the ACP.

7.6.9 VIP Converted Files Amplitude/Volume Adjustment to Match DECtalk Synthesized Voice Output Level

The ability to adjust the amplitude/volume of converted audio files sent back to CRS was added in build 2.0.1. A range selection is provided as a slide bar located within the *System Settings* interface. The version 2.0 setting (-4 dB attenuation relative to the amplitude created by the downsample routine) is the default setting. It is also important to note that amplitude adjustments only affect *.Pv* files sent back to CRS and also affect both male and female voice types used.

1. Select the **Broadcast Cycle** window under the *Transmitter* menu from the *CRS Main Menu* (see Section 3, Figure 28, of the *Site Operator's Manual*).
2. Click the first transmitter under the *transmitters/playbacks* section (left side of window).
3. To determine which message is currently being broadcast, observe the *Transmit Time* column. The last message highlighted in green is currently being broadcast. If the *Message Name* column has **VIP ID** in the name, it was converted by the Voice Improvement Processor.
4. While a VIP message is playing, check the ACP VU meter to ensure that the peak deflection is approximately **0** ± 2. Record the initial ACP VU meter reading in table 8.
5. If the measurement taken in step 4 requires adjustment, then go to step 6. Otherwise, record the final VU meter value in table 8 and go to step 15.
6. Select the **System Settings** button from the VIP Main Menu. The *System Settings* window displays.
7. If the VIP Application is running, a message window displays the following: *NOTE: VIP is running. Changes do not take hold until you press stop, then start on the main interface.*
8. Click **OK** to acknowledge message.
9. Use the slide bar under *CRS Audio (.Pv) Adjustment* to increase or decrease the amplitude of the *.Pv* file. (This file is sent from VIP to Master MP). This only affects new messages processed by the VIP computer.
10. Click **apply** on the *System Settings* window.
11. Click **OK** to acknowledge *Settings save* message window.

12. Click **OK** on the *System Settings* window to close window.
13. On the VIP Main Menu, click **stop**, then **start** to restart the VIP Application.
14. Resend a product designated for conversion by VIP from AWIPS to CRS.
15. Check the *Broadcast Cycle* on CRS to determine when the new message is playing. While the new message is playing, check the ACP VU meter to ensure that the peak deflection is approximately **0** ± 2.
16. If the measurement requires adjustment, then repeat steps 6 through 13. Otherwise, record the final VU meter value and go to step 17.
17. The VIP audio level adjustment affects both male and female voice types. This adjustment matches the DECtalk Synthesized Voice Output Level and the VIP converted files amplitude/volume.

Table 8. CRS System Alignment Measurements

Site: **ASM Card #** Date:

Note: Sections 7.4.1, 7.4.3, & 7.6.9 adjustments only need to be performed for ASM card #1					
	Before Adjustment (Initial)			Final Reading	
Section: Step #	Function	Level (dBm)	Amplitude (CRS Slider)	Level (dBm)	Amplitude (CRS Slider)
7.4.1: 3, 9	Ref. Mark	N/A	On | Above | Below Mark	N/A	On | Above | Below Mark
7.4.2: 5, 7	BUL WAT 1050 Hz	5	N/A	7	N/A
7.4.2: 9	BUL SW 1 1800 Hz	N/A	N/A	9	N/A
7.4.2: 11	BUL SW 2 2400 Hz	N/A	N/A	11	N/A
7.4.3: 6	BUL SAME 1562+2052	6	N/A	6	N/A
7.6.2: 6, 10, 11	CRS SAME 1562+2052	10	6	11	11
7.6.3: 6, 10, 11	CRS WAT 1050 Hz	10	6	11	11
7.6.4: 6, 10, 11	CRS SW 1 1800 Hz	10	6	11	11
7.6.4: 6, 10, 11	CRS SW 2 2400 Hz	10	6	11	11
7.6.5: 4, 10, 11, 14	CRS Voice Volume	4	10	11/14	11
7.6.6: 4, 5, 8, 13, 14	CRS VIP Male Eng.	4	8/13	5/13	13
7.6.6: 4, 5, 8,13	CRS VIP Female Eng.	4	8/13	5/13	13
7.6.6: 4, 5, 8, 13	CRS VIP Spanish	4	8/13	5/13	13

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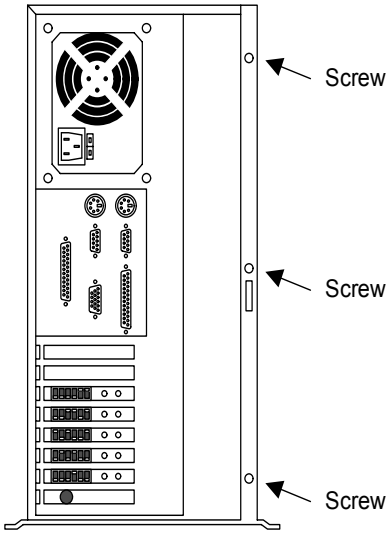
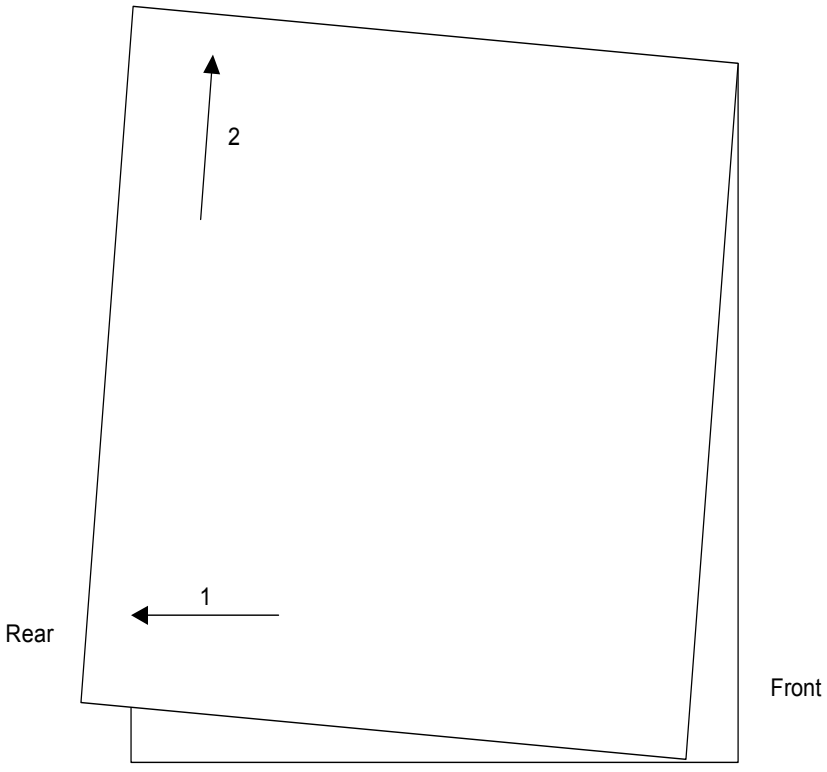
ATTACHMENT B
CRS Hardware Drawings



Remove the mounting screws located on the back of the processors



To remove the cover, push the cover backward and pull it upward

Figure A-1. Main Processors and Front-end Processors—Cover Removal

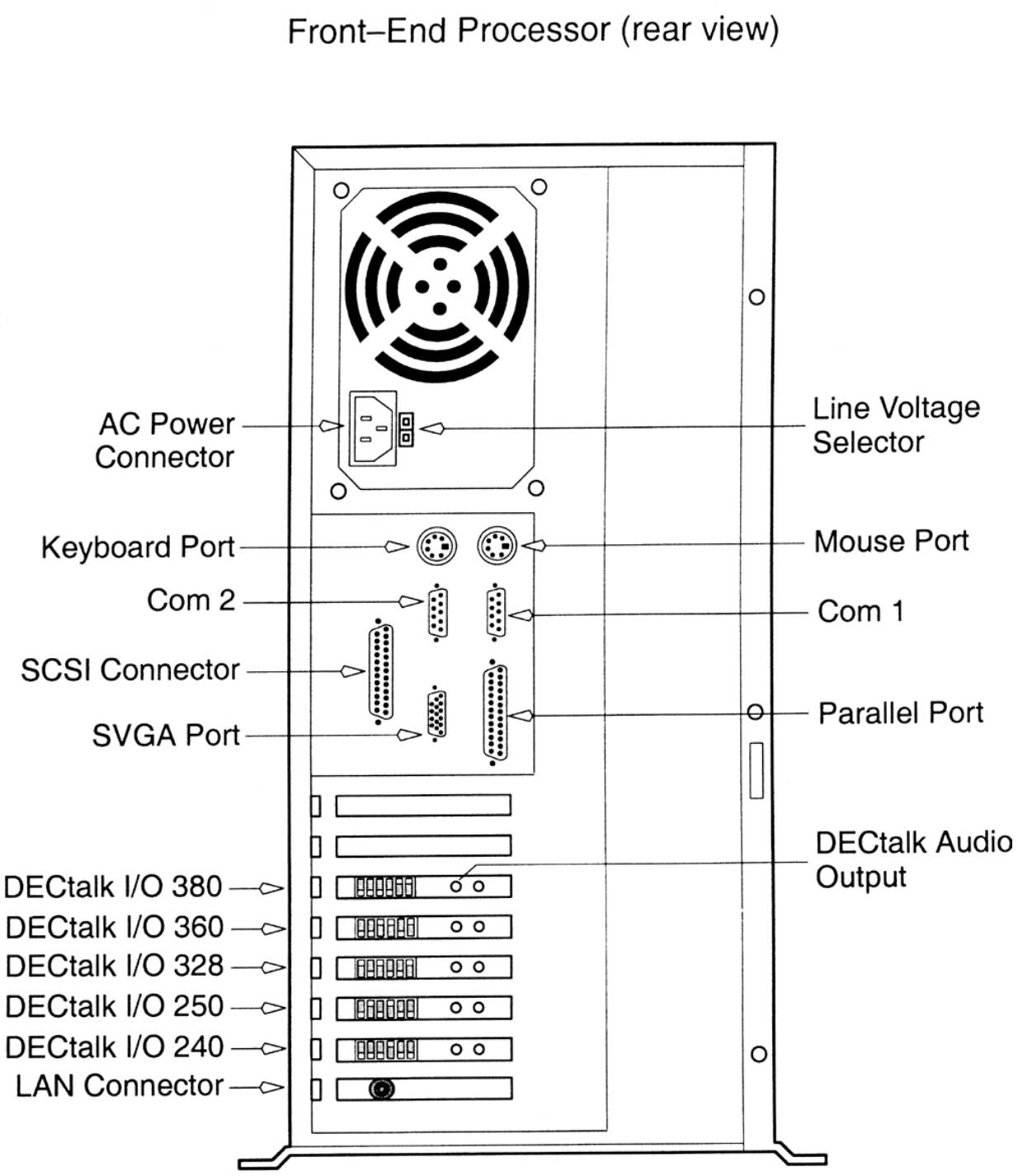


Figure A-5. Front-end Processors—Rear View

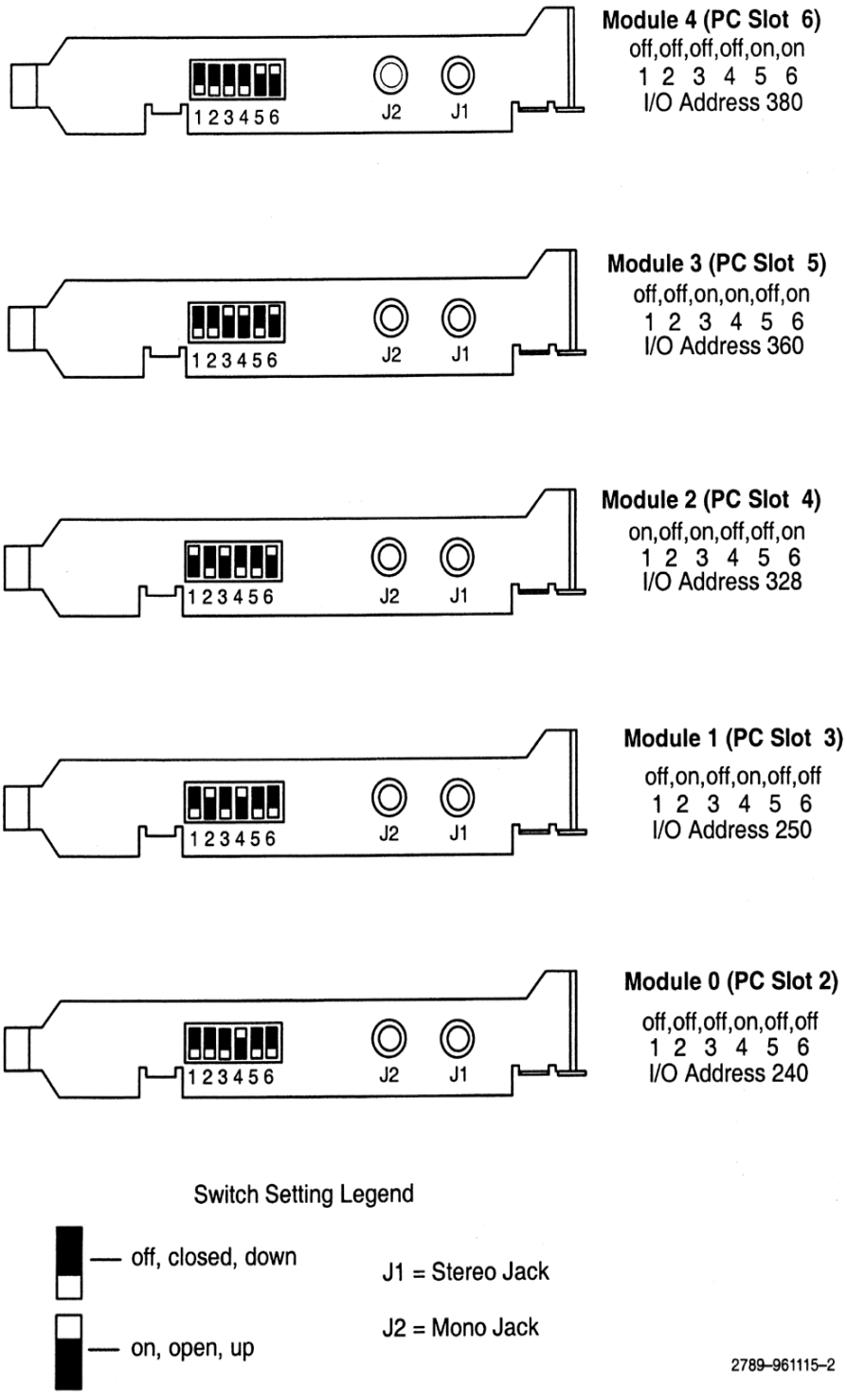


Figure A-11. DECtalk Card Switch 2 Settings for I/O Addresses

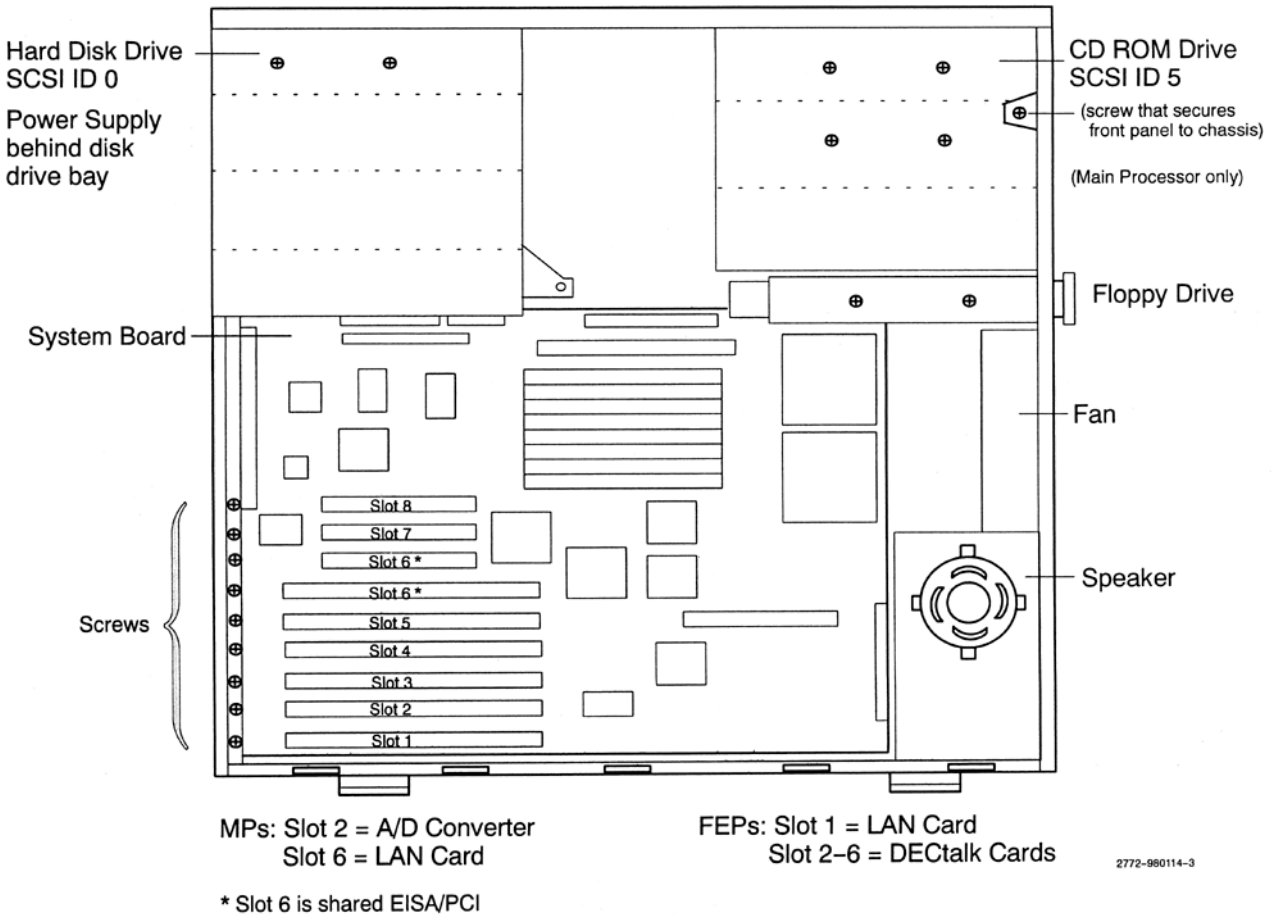


Figure A-13. Main Processors and Front-End Processors (side panel removed)

FEP1 & Backup FEP = Typical Configuration
FEP1, FEP2 & Backup FEP = Large Configuration
FEP1, FEP2, FEP3 & Backup FEP = Maximum Configuration

The LAN Bridge is a dual port AUI device. A contractor provided AUI/BNC transceiver is used to connect to the CRS LAN. The second port is for connection to the AWIPS LAN using a contractor provided AUI/TP transceiver.

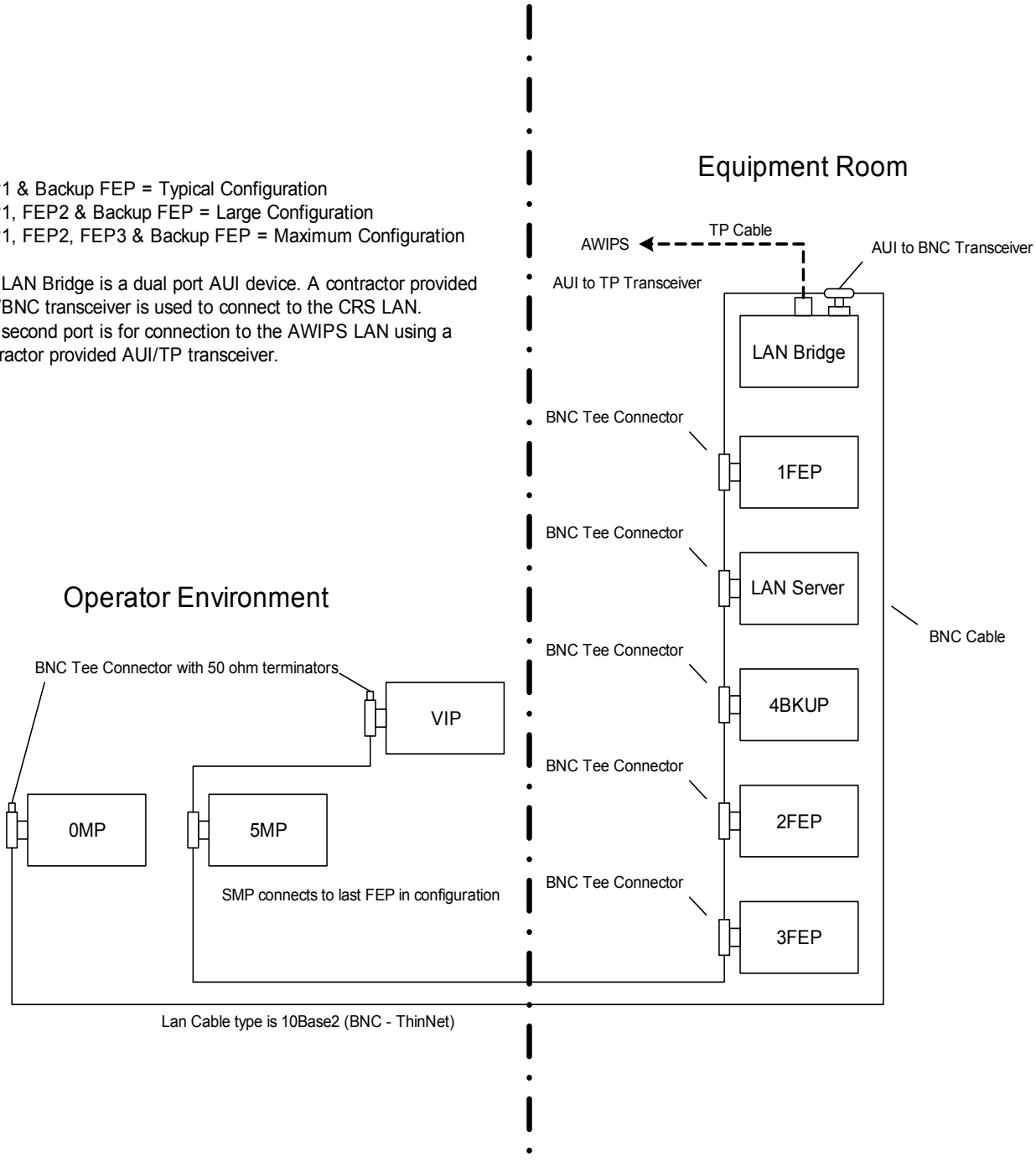


Figure A-15. LAN Cable Distribution Scheme

ATTACHMENT C
New Configuration Physical Verification
Large 7-Channel System
Required MPs, FEPs, DECtalks, ASC, and ASMs

The **Large 7-channel** system has 2 MPs (0MP and 5MP), 3 FEPs (1FEP, 2FEP, and 4BKUP), 14 DECtalk cards, 1 ASC card, and 10 ASM cards:

0MP	main processor 1		
5MP	main processor 2		
1FEP	front-end processor 1		
	LAN Card	LAN interface	(slot 1)
	DECtalk 1	channel 1	(slot 2)
	DECtalk 2	channel 2	(slot 3)
	DECtalk 3	channel 3	(slot 4)
	DECtalk 4	channel 4	(slot 5)
	DECtalk 5	PB1	(slot 6)
2FEP	front-end processor 2		
	LAN Card	LAN interface	(slot 1)
	DECtalk 1	channel 4	(slot 2)
	DECtalk 2	channel 5	(slot 3)
	DECtalk 3	channel 6	(slot 4)
	DECtalk 5	PB2	(slot 6)
4BKUP	backup front-end processor		
	LAN Card	LAN interface	(slot 1)
	DECtalk 1	backup channel 1 or 5	(slot 2)
	DECtalk 2	backup channel 2 or 6	(slot 3)
	DECtalk 3	backup channel 3 or 7	(slot 4)
	DECtalk 4	backup channel 4	(slot 5)
	DECtalk 5	backup PB1 or PB2	(slot 6)
ASA	audio switch assembly		
ASC	audio switch controller		
	ASM 1	channel 1	(slot 1)
	ASM 2	channel 2	(slot 2)
	ASM 3	channel 3	(slot 3)
	ASM 4	channel 4	(slot 4)

ASM 5	channel 5	(slot 5)
ASM 6	channel 6	(slot 6)
ASM 7	channel 7	(slot 7)
ASM PB1	monitor/playback channel 1	(slot PB1)
ASM PB2	monitor/playback channel 2	(slot PB2)
ASM Spare	spare	(slot S)

DECtalk Card Configurations

There is one I/O jumper to be set on each DECtalk card:

DECtalk Card	FEP Name	FEP Slot #	I/O Address Jumper
1FEP DECtalk 1 (channel 1)	1FEP	2	240
1FEP DECtalk 2 (channel 2)	1FEP	3	250
1FEP DECtalk 3 (channel 3)	1FEP	4	328
1FEP DECtalk 4 (channel 4)	1FEP	5	360
1FEP DECtalk 5 (mon/playback chan 1)	1FEP	6	380
2FEP DECtalk 1 (channel 5)	2FEP	2	240
2FEP DECtalk 2 (channel 6)	2FEP	3	250
2FEP DECtalk 3 (channel 7)	2FEP	4	328
2FEP DECtalk 5 (mon/playback chan 2)	2FEP	6	380
4BKUP DECtalk 1	4BKUP	2	240
4BKUP DECtalk 2	4BKUP	3	250
4BKUP DECtalk 3	4BKUP	4	328
4BKUP DECtalk 4	4BKUP	5	360
4BKUP DECtalk 5	4BKUP	6	380

ASM Card Configurations

There are five jumpers to be set on each ASM card:

ASM Card	ASA Slot #	Silence Alarm Jumper JP1	ACP Channel Select Jumpers JP2 & JP3	BKUP Live/ Playback Cntrl Jumper JP4	FEP Select Jumper JP5
ASM 1 (channel 1)	1	EN (Enable)	1	BUL2	1FEP
ASM 2 (channel 2)	2	EN (Enable)	2	BUL2	1FEP
ASM 3 (channel 3)	3	EN (Enable)	3	BUL2	1FEP
ASM 4 (channel 4)	4	EN (Enable)	4	BUL2	1FEP
ASM 5 (channel 5)	5	EN (Enable)	5	BUL2	2FEP
ASM 6 (channel 6)	6	EN (Enable)	6	BUL2	2FEP
ASM 7 (channel 7)	7	EN (Enable)	7	BUL2	2FEP
ASM PB1 (mon/playback chan 1)	PB1	DIS (Disable)	PB1	PB	1FEP
ASM PB2 (mon/playback chan 2)	PB2	DIS (Disable)	PB2	PB	2FEP

ASC Card Configuration

Refer to figure 1. On both the operational and spare ASC, set the backup channel configuration by positioning the seven jumpers on JP1. Using all seven jumpers, move the jumpers to the side of the block that lists the number of output channels for your site configuration (the center row of pins is common). For example, if your site has 5, 6, 9, or 10 channels, connect each jumper from the center pin to the top pin; if your site has 1, 2, 3, 4, 7, 8, 11, 12, or 13 channels, connect each jumper from the center pin to the bottom pin.

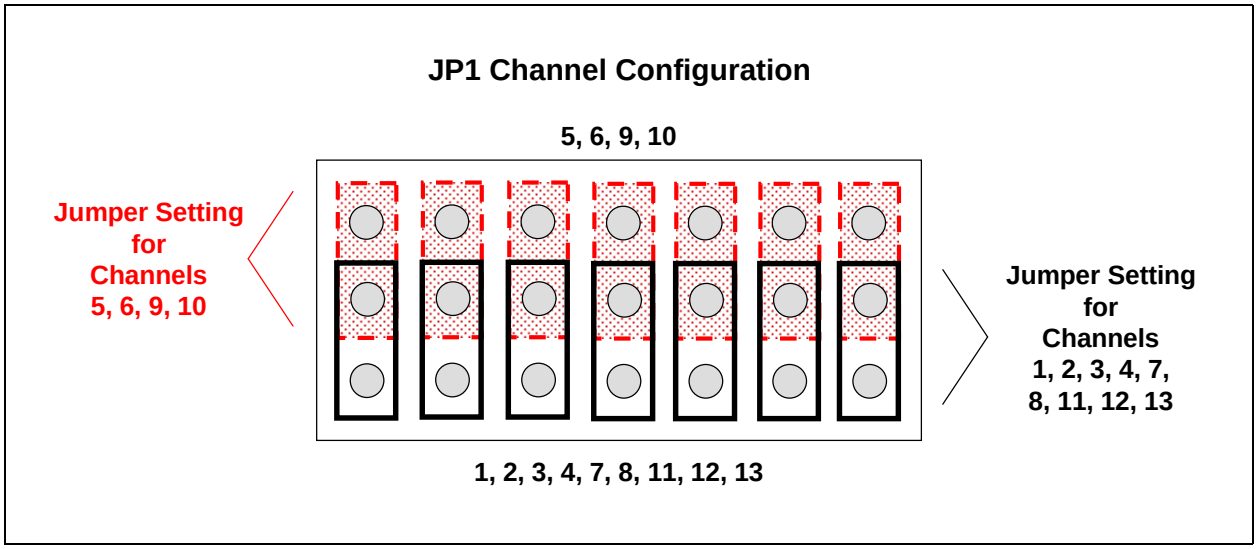


Figure 1. ASC Card Jumper Block

Cable Label Between DECtalk Card and ASM Card

From	To	Cable Label
1FEP DECtalk 1 “J2” Port	ASM 1 “IN Port”	1-1
1FEP DECtalk 2 “J2” Port	ASM 2 “IN Port”	1-2
1FEP DECtalk 3 “J2” Port	ASM 3 “IN Port”	1-3
1FEP DECtalk 4 “J2” Port	ASM 4 “IN Port”	1-4
2FEP DECtalk 1 “J2” Port	ASM 5 “IN Port”	2-1
2FEP DECtalk 2 “J2” Port	ASM 6 “IN Port”	2-2
2FEP DECtalk 3 “J2” Port	ASM 7 “IN Port”	2-3
1FEP DECtalk 5 “J2” Port	ASM PB1 “IN Port”	1-5
2FEP DECtalk 5 “J2” Port	ASM PB2 “IN Port”	2-5

Cable Label Between DECtalk Card and ASC Card

From	To	Cable Label
4BKUP DECtalk 1 “J2” Port	ASC “BKUP Audio 1” Port	4-1
4BKUP DECtalk 2 “J2” Port	ASC “BKUP Audio 2” Port	4-2
4BKUP DECtalk 3 “J2” Port	ASC “BKUP Audio 3” Port	4-3
4BKUP DECtalk 4 “J2” Port	ASC “BKUP Audio 4” Port	4-4
4BKUP DECtalk 5 “J2” Port	ASC “BKUP Audio 5” Port	4-5

ATTACHMENT D
Sample EMRS Report